

Relationship between Inflation and Economic Growth: Determining the Threshold Level of Inflation in Bangladesh

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Outline

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Introduction

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- It is widely discussed and debatable issue in both theoretical and empirical findings.
 - ❖ Positive relationship between inflation and economic growth
 - ❖ Negative relationship between inflation and economic growth
 - ❖ Positive when inflation is low but negative for high inflation
- Inflation may affect investment which can affect growth
 - ❖ Higher inflation has a negative impact on private investment in manufacturing.
- That is why, optimal growth can be achieved by controlling inflation and side by side raising opportunities and facilities for private investment.

Literature Review

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- ❖ Barro (1990)
- ❖ Fischer (1993)
- ❖ Bruno and Easterly (1996)
- ❖ Sarel (1996)
- ❖ Ghosh and Phillips (1998)
- ❖ Khan and Senhadji (2001)
- ❖ Mallik and Chowdhury (2001)
- ❖ Ahmed and Mortaza (2005)
- ❖ Hayat (2012)
- ❖ Younus (2012)

Objectives

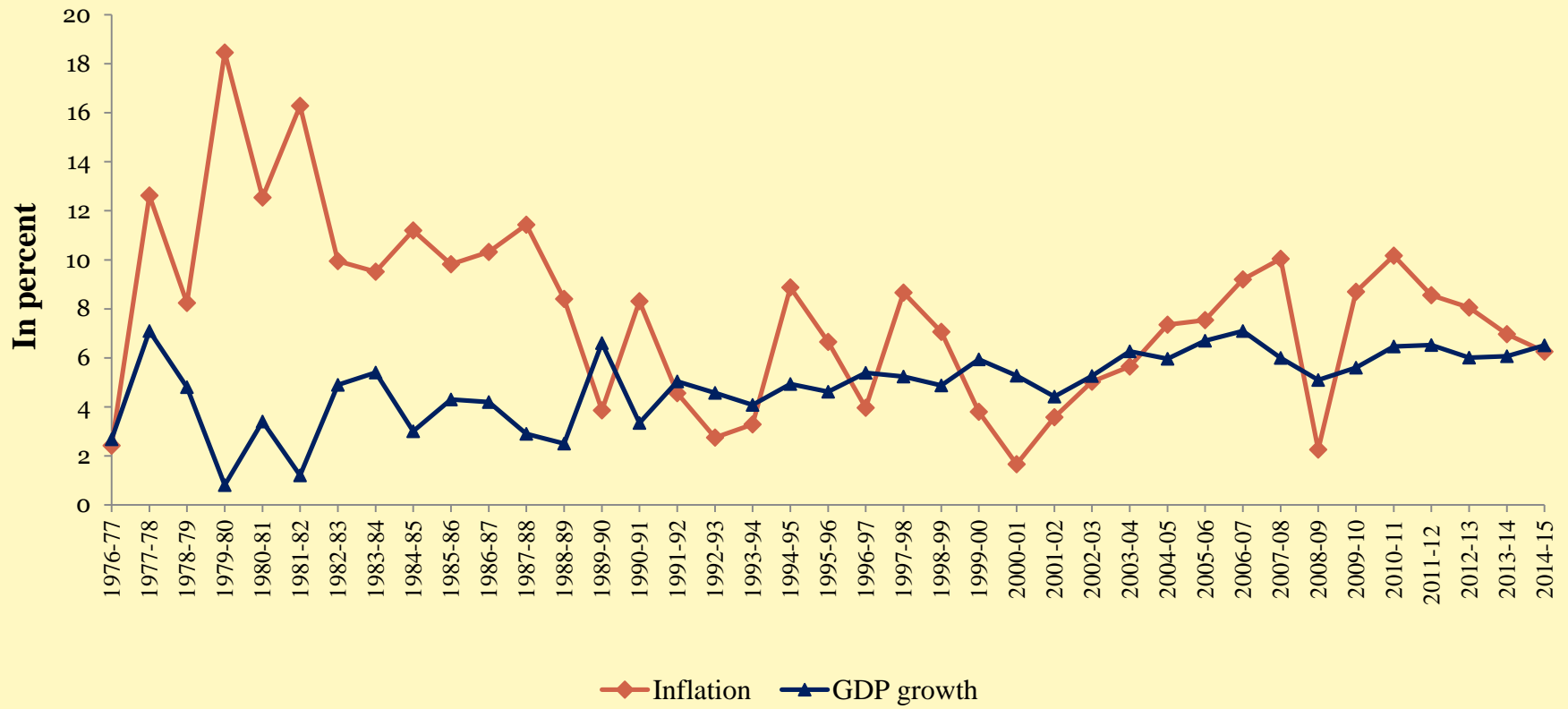
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- To examine the inflation-growth nexus empirically in Bangladesh using annual data for the period FY1977–FY2015.
- To find out the threshold level of inflation rate for Bangladesh economy.
- To cushion efficient and effective policy recommendations for future.

Historical Trends of Inflation and Economic Growth in Bangladesh

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Chart-1: Historical data: Inflation-GDP Growth



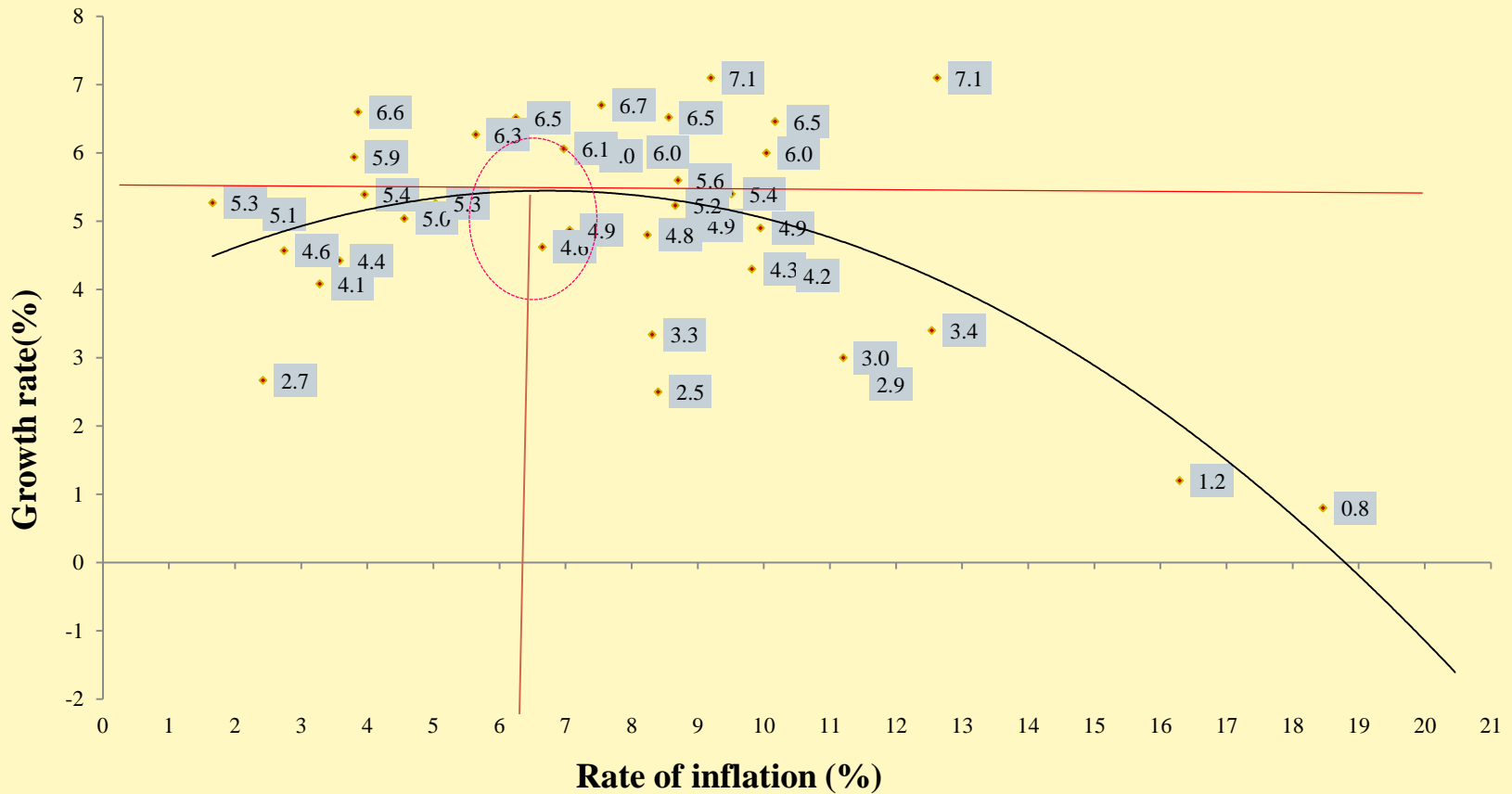
GDP Growth-Inflation Relationship

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Level	Observations	Inflation Range (%)	Average GDP Growth %
1 st Level	4	upto 3.00	4.40
2 nd Level	6	3.01-5.00	5.25
3 rd Level	5	5.01-7.00	5.74
4 th Level	11	7.01-9.00	5.13
5 th Level	13	above 9.00	4.37

GDP growth and inflation (scatter diagram with polynomial (dgree-2))

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Methodology and Model Specification

1. Simple Model:

$$y_t = \alpha + \beta_1 \pi_t + u_t$$

Prior expectation: $\beta_1 > 0$ or $\beta_1 < 0$, where y_t = real GDP growth, π_t = inflation rate.

2. Threshold Model:

A. Sarel (2005) Method

$$y_t = \alpha + \beta_1 \pi_t + \beta_2 D_i (\pi_t - \pi^*) + u_t \dots \dots \dots (1)$$

where, D_i = Dummy for a threshold level of inflation. π^* = A level of threshold inflation.

$D_i = 1$, if $\pi_t > \pi^*$ and 0 otherwise.

- ❖ Prior expectation: $\beta_1 > 0$ and $\beta_2 < 0$
- ❖ Determination of a threshold inflation: $(\beta_1 + \beta_2) < 0$ and statistically significant.
- ❖ Iterative process assuming structural break: $\pi^* = 4$ to 7 %
- ❖ Detection of Appropriate threshold : **The highest R^2 or lowest residual sum of squares (RSS)**

B. Quadratic Model

$$y_t = \alpha + \beta_1 \pi_t + \beta_2 \pi_t^2 + u_t \dots \dots \dots (1)$$

Prior expectation: $\beta_1 > 0$ and $\beta_2 < 0$

Empirical Results

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1. Simple Model:

$$y_t = 6.12^* - 0.16^{**}\pi_t + u_t$$

(11.50) (-2.54)

Adj R² 0.20 F-statistic 6.47

(* and ** denotes coefficients are significant at 1% and 5% levels respectively).

Diagnostic Tests

❖ Diagnostic tests for simple model are satisfied.

Empirical Results

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1. Threshold Model:

A. Sarel Method

$$y_t = 3.54^* + 0.42^{**} \pi_t - 0.81^*(\pi_t - \pi^*)$$

(11.50) (-2.54) (-3.88)

Adj R² 0.35 F statistic 11.21

where threshold level of inflation (π^*) = 6.25%

(* and ** denotes coefficients are significant at 1% and 5% levels respectively).

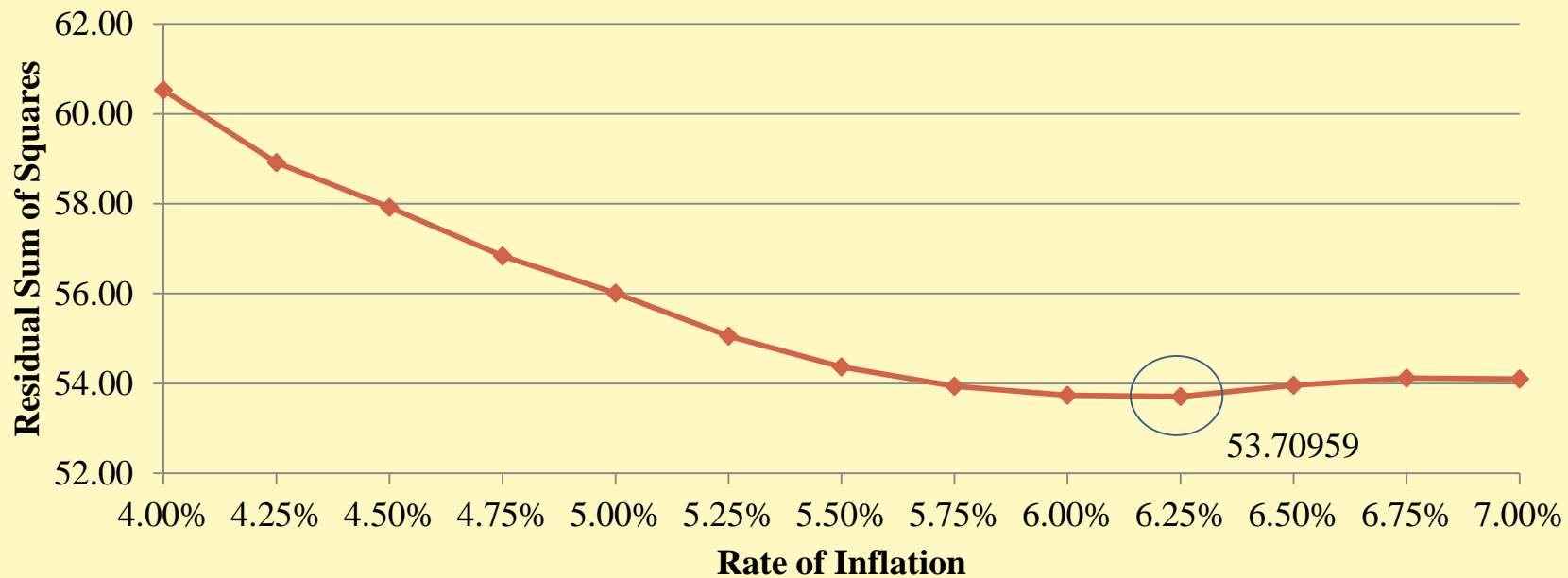
Diagnostic Tests

❖ Diagnostic tests for Sarel model are satisfied.

Empirical Results: Threshold Detection

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The value of π^* versus the residual sum of squares



Empirical Results: Threshold Model

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B. Quadratic Model

$$y_t = 3.76^* + 0.50^* \pi_t - 0.04^* \pi_t^2$$

(4.91) (2.81) (-3.86) Adj R² 0.37 F-statistic 11.93

(* and ** denotes coefficients are significant at 1% and 5% levels respectively).

Diagnostic Tests

❖ Diagnostic tests for quadratic model are satisfied.

The conditions for maximization for quadratic equation are satisfied.

1st order condition : $\frac{dy}{d\pi} = 0.5 - 0.08 \pi = 0$

2nd order condition : $\frac{d^2y}{d\pi^2} = -0.08, \text{ which is } < 0$

Optimal rate of inflation : $\pi^* = \frac{0.50}{0.08} = 6.25$

Empirical Findings

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- ❖ Non linear relationship between GDP growth and inflation: positive when inflation is low but negative for high inflation.
- ❖ The estimated threshold level of inflation is at 6.25 percent.

Concluding Remarks and Policy Recommendations

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- ❖ Sustained growth needs macroeconomic stability with sufficient investment keeping inflation at low level.
- ❖ Controlling price level below the threshold level through Monetary policy.
- ❖ To tame inflation within growth-enhancing ranges and policy tightening through complementary mix of monetary and fiscal policies.
- ❖ Keeping inflation at a tolerable level to achieve the optimum economic growth.
- ❖ Rational target of inflation must be set.

Thank you all